

# Reasons for Priority Project Determination - NREP1

17 November 2023

On 17 November 2023, I published a determination in the *Government Gazette* that the North Region Energy Project Stage 1 (NREP1) is a 'priority project', pursuant to section 15.1A of the Electricity Networks Access Code 2004 (Access Code).

In accordance with 15.2A of the Access Code, I am required to publish the reasons for the priority project determination, including the basis on which it meets the Access Code Objective. The publication of this document meets the Access Code requirements for the NREP1 Priority Project determination.

*Hon Bill Johnston MLA, Minister for Energy*

## **North Region Energy Project Stage 1**

The determination of the NREP1 as a priority project is based on its identification through comprehensive modelling as a necessary, critical, and time-sensitive project needed to ensure the future needs of electricity consumers in the South West Interconnected System (SWIS) are met at lowest overall cost.

### **Modelling through the *South West Interconnected System Demand Assessment***

The *South West Interconnected System Demand Assessment* (SWISDA), published in May 2023, collated industry data to understand future electricity demand, considering both the requirements of existing industrial users on the SWIS and potential growth in new industries like hydrogen and critical minerals.

The SWISDA modelling utilised a complex linear programming model to simulate the operation of SWIS assets and determine the network, generation and storage infrastructure required to meet electricity demand at the lowest overall cost to the system, across a 20-year time horizon.

- The model represented the SWIS as 14 nodes with different load profiles in different areas of the network and allocated each SWIS generator, along with its individual cost and technical parameters, to one of the nodes.
- Each node also included several generation and storage candidates with individual build costs and technical parameters that could be built by the model to help meet demand throughout the study period, and included transmission network candidates that could be built to increase network transfer capacity between the nodes.
- The model simulated the operation of SWIS generation and storage assets and solved a mathematical optimisation problem to minimise total system costs, selecting from the generation, storage and transmission network candidates to determine the optimal location, size and timing of any new infrastructure investments required to meet future SWIS electricity demand.

### **The SWIS northern corridor is a high priority**

Across all modelled scenarios, the SWISDA modelling identified a need for substantial new transmission network capacity to be built between the nodes in the northern parts of the SWIS as soon as possible. This network investment and expansion was identified in the modelling as it would both remove constraints on existing generators and allow for the

connection of substantial new generation capacity in areas with excellent renewable resources.

Urgent northern transmission network investments were selected even in scenarios with relatively low demand growth, as substantial new generation capacity will be required to meet SWIS demand in the near-term, while facilitating the staged retirement of coal-fired generation assets. The modelling indicates that these investments should be pursued as a priority to unlock the network capacity required to maintain SWIS electricity supply throughout the energy transition and concludes that significant network augmentation is critical to deliver renewable energy resources that meet this future electricity demand.

In addition, the Australian Energy Market Operator's *2023 Electricity Statement of Opportunities* shows that electricity demand is expected to increase greatly for the remainder of the decade but the network is rapidly approaching capacity.

This area of the SWIS contains most of the existing renewable generation capacity (primarily utility-scale wind farms), some of which is currently constrained by available network capacity, but which could service growth of electricity demand in the region and elsewhere in the SWIS. However, for their potential to be realised, an increase in network capacity is required.

Through the SWISDA consultation period, multiple stakeholders agreed with the findings of modelling that network augmentation in the SWIS northern corridor is a priority due to the very high-capacity factors for wind and solar resources in that area, as well as access to land for large-scale project development.

### Urgency

The SWISDA modelling also outlines that network investments must commence as a matter of priority and urgency. To meet delivery timeframes outlined in the SWISDA (requiring new network to be commissioned as soon as 2027), there is an immediate need to enable Western Power to continue work on the planning, engineering, community consultation and economic assessment of the development of its network.

The NREP1 project scoping has been progressed by Western Power based on its identification as an urgent project, and utilises existing transmission corridors and easements. Network options modelled in the SWISDA used pre-existing network before seeking to build new network as an economically efficient, lowest-cost model. In the North, the SWISDA modelling sought to build out the existing network in the north through upgrading and augmenting existing assets.

Given this, other major transmission development would not be deliverable in the same timeframe, and delivery of new network and renewable energy generation for the SWIS would likely be delayed. Delays in progressing network investments will significantly compromise the ability for both governments and industry to meet their emissions reductions targets and decarbonisation commitments.

### Identification of the 'North Region Energy Project Stage 1' as a Priority Project

The SWISDA set out a staged approach to network augmentation. The SWISDA Stage 1 includes "upgrading the northern corridor, building a new line from the metropolitan area to Neerabup, and converting the existing line between Neerabup and Mid West from 132 kV to 330 kV".

The NREP1 will deliver SWISDA Stage 1 network augmentation in the northern corridor.

The scope of the NREP1 has been determined to include:

- a) Upgrade of the existing 132kV transmission line between Northern Terminal and Three Springs Terminal to 330kV;
- b) Installation of a new 330kV double circuit transmission line from Northern Terminal to Neerabup Terminal; and
- c) Associated network augmentation to connect the new infrastructure to the existing network, and de-meshing augmentations to improve efficiency of network operation.

Significant transmission network investment is needed in the SWIS, and prioritisation of NREP1 is critical to ensure the power system continues to operate reliably, securely and in the long-term interests of consumers, while also facilitating delivery of low-emissions electricity enabling Western Australia to realise its low-carbon future.

#### Determination on the basis of meeting the Access Code Objective

A Priority Project determination must also meet the Access Code Objective:

##### **Code objective**

- 2.1 The objective of this Code ("**Code objective**") is to promote efficient investment in, and efficient operation and use of, *services of networks* in Western Australia for the long-term interests of *consumers* in relation to:
- (a) price, quality, safety, reliability and security of supply of electricity;
  - (b) the safety, reliability and security of *covered networks*; and
  - (c) the environmental consequences of energy supply and consumption, including reducing greenhouse gas emissions, considering land use and biodiversity impacts, and encouraging energy efficiency and demand management.

The determination of NREP1 as a priority project meets the Access Code objective by promoting the long-term interests of consumers in respect of efficient investment in the electricity network. In particular, it meets it in relation to price of electricity supply, as the NREP1 was identified in long-term whole of system modelling to meet electricity consumers' needs at lowest sustainable cost.

It also achieves this in relation to the safety, reliability and security of electricity supply and the electricity network, identified through the same modelling which incorporates these considerations as key assumptions. Modelling scenarios were based on the ability of the network to deliver electricity to consumers as both near-term and forecasted future demands on the network increase, as well as the demand to source electricity from renewable sources, increases.

In relation to environmental consequences, the determination of NREP1 as a Priority Project is important to enable greater capacity to be made available to existing renewable generation and allow further connection of new and varied sources of renewable electricity to the SWIS, through lowest-cost network upgrades. This will assist the system to decarbonise while maintaining system security and reliability, which will assist in reducing system greenhouse gas emissions. Further, because NREP1 primarily upgrades current network infrastructure and utilises existing transmission corridors, impacts on land use and biodiversity are minimised.

In conclusion, the NREP1 has been determined as a priority project as it is urgent and necessary to meet the needs of existing and future electricity consumers at lowest sustainable cost while also promoting environmental outcomes.